ElliottWood

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Kingsway House SuDS Comment Responses

Aim

To address the comments made by Camden Council on the Sustainable Drainage Strategy Report KGH-EWP-ZZ-XX-RP-C-000001, dated 19.07.24 submitted to support the planning application for the re-development of Kingsway House.

Summary

The below requests and *recommendations* were received from Camden on 10.09.24. Responses to each comment and recommendation are made in red.

Review Summary:

This application has not sufficiently demonstrated the use of the London Plan's drainage hierarchy and is proposing the following key items:

- ***Type of development:*** *Change of use from office to apartment hotel of 3,595sqm*
- ***Flood risk:*** *Not on a previously flooded street or in a Local Flood Risk Zone but medium risk of surface water flooding.*
- ***Types of conveyance / attenuation features****: Blue and green roofs*
- ***Greenfield runoff rate****: 0.5*
- ***Runoff rate restriction (l/s)****: 10.4*
- ***Runoff attenuation volume (m³)****: 6.1 or 6.8 tbc*
- ***Maintenance plan****: Provided but maintenance owner not named.*

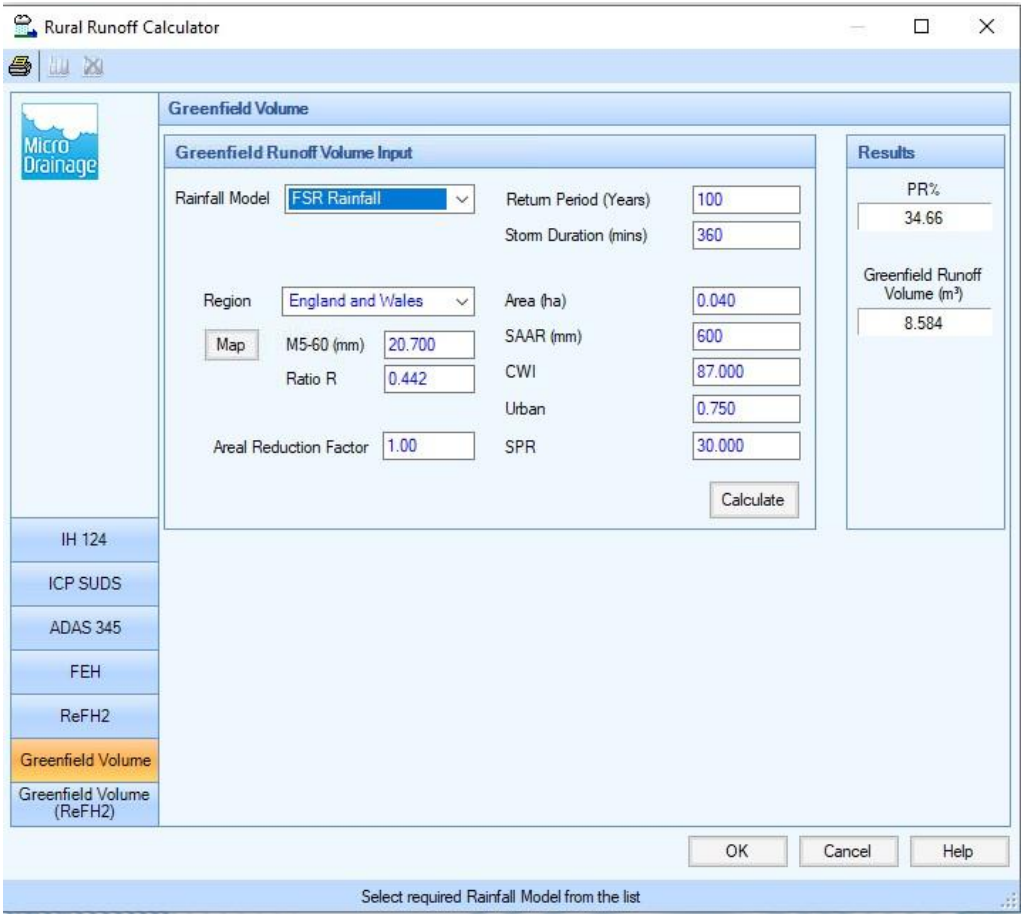
Certified B Corporation

Recommendation and requests:

We require more information and improved proposals before recommending approval of the application for the following reasons:

1) *The proposed runoff rate is higher than the greenfield rate and the applicant has not provided sufficient justification to demonstrate that the runoff rate has been restricted to as close as practicable to the greenfield rate in order to comply with Defra's Non-technical standard S3. Shows that the proposed runoff rate has been restricted as close as possible to the greenfield runoff rate, and if not equal to the greenfield runoff rate provides sufficient justification as to why the proposed rate has been reduced as far as possible. Restricting the run off rate further would require a significant increase in surface water attenuation. At present, given the nature of the development (the building occupies the whole site) we are utilising all accessible flat space at roof level to provide blue roof storage, a sustainable method of water storage and discharge. If we were to provide further means of attenuation, it would need to be located below basement slab in the form of a concrete tank which would require a pump station to discharge surface water to the existing sewer. Adding a pump would increase maintenance requirements and potentially lead to an increase in flood risk within the basement. As stated in Defra's Non-technical standard S12, pumping should be seen as a last resort if drainage via gravity is not reasonably practicable.*

2) *The applicant has not provided the greenfield runoff volume nor the existing runoff volume in order to confirm compliance with Non-technical standards S5 and S6. Provides the greenfield runoff volume and the existing runoff volume in order to be compared to the proposed runoff volume (and clarifies if this Blue roof: 6.1 (SuDS Report, p27/38) Or Blue roof: 6.8 (SuDS Report, p30/38). The greenfield runoff volume is now provided. The blue roof volume is 6.1m³ as per the blue roof calculations.*



3) *The applicant has not provided any calculations to demonstrate no flooding on site for the 1 in 30 year or the 1 in 100 year event in order to demonstrate compliance with Non-technical standards S7 and S8. Provides calculations to demonstrate no flooding on site in the 1 in 30 year event and 1 in 100 year event. Microdrainage calculations have now been attached (refer to Appendix A) showing no flooding for all events up to and including the 1 in 100 year +40% climate change.*

4) *The applicant should provide details of how exceedance flows will be managed in order to comply with Non-technical standards S9. Demonstrates how exceedance flows will be managed on site so as not to increase flood risk.* Drawing 2230217-EWP-ZZ-00-DR-C-12001 in Appendix B shows exceedance flows. The building FFLs have been set at a level higher than the surrounding footways. This means that any exceedance flows will drain away from the building thresholds and will be captured by the existing highway drainage in Great Queen Street, Kingsway and Parker Street.

5) *The applicant has not provided details of the owner of the maintenance of the drainage features. Provides details of who will be responsible for maintenance of the drainage features. It shall be the responsibility of the building management company to ensure maintenance of the drainage system is carried out as per the maintenance schedule. At this stage, there is no information on the building management company.*

Conclusion

The proposed drainage strategy seeks to reduce the surface water discharge rate as far is as reasonably practicable. The opportunity to implement SuDS across the scheme is limited due to the extent of the development. It is proposed to utilise blue roofs across the accessible flat roof areas. The remaining areas of the roof is unusable due to the mansard proposal and plan layout. As outlined in the response to Comment 1, the surface water discharge rate could be reduced further by introducing a tank below basement slab with a pump station. However, this would increase the basement flood risk, increase drainage maintenance and be less sustainable. It is therefore considered that it would be more detrimental to propose the pumped option as opposed to the blue roof proposal.

Appendix A – MicroDrainage Calculations

STORM SEWER DESIGN by the Modified Rational Method

Design Criteria for Storm

Pipe Sizes STANDARD Manhole Sizes STANDARD

FSR Rainfall Model - England and Wales

Return Period (years)	100	PIMP (%)	100
M5-60 (mm)	20.700	Add Flow / Climate Change (%)	0
Ratio R	0.441	Minimum Backdrop Height (m)	0.200
Maximum Rainfall (mm/hr)	50	Maximum Backdrop Height (m)	1.500
Maximum Time of Concentration (mins)	30	Min Design Depth for Optimisation (m)	1.200
Foul Sewage (l/s/ha)	0.000	Min Vel for Auto Design only (m/s)	1.00
Volumetric Runoff Coeff.	0.750	Min Slope for Optimisation (1:X)	500

Designed with Level Soffits

Network Design Table for Storm

PN	Length (m)	Fall (m)	Slope (1:X)	I.Area (ha)	T.E. (mins)	Base Flow (l/s)	k (mm)	HYD SECT	DIA (mm)	Section Type	Auto Design
1.000	1.030	0.010	103.0	0.006	5.00	0.0	0.600	o	100	Pipe/Conduit	
1.001	0.996	0.010	99.6	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
1.002	6.451	1.000	6.5	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.000	1.323	0.010	132.3	0.006	5.00	0.0	0.600	o	100	Pipe/Conduit	
2.001	1.040	0.010	104.0	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	
2.002	9.790	1.000	9.8	0.000	0.00	0.0	0.600	o	100	Pipe/Conduit	

Network Results Table

PN	Rain (mm/hr)	T.C. (mins)	US/IL (m)	Σ I.Area (ha)	Σ Base Flow (l/s)	Foul (l/s)	Add Flow (l/s)	Vel (m/s)	Cap (l/s)	Flow (l/s)
1.000	50.00	5.02	49.700	0.006	0.0	0.0	0.0	0.76	5.9	0.8
1.001	50.00	5.04	49.690	0.006	0.0	0.0	0.0	0.77	6.1	0.8
1.002	50.00	5.08	21.000	0.006	0.0	0.0	0.0	3.06	24.1	0.8
2.000	50.00	5.03	49.700	0.006	0.0	0.0	0.0	0.67	5.2	0.9
2.001	50.00	5.06	49.690	0.006	0.0	0.0	0.0	0.75	5.9	0.9
2.002	50.00	5.12	21.000	0.006	0.0	0.0	0.0	2.48	19.5	0.9

Area Summary for Storm

Pipe Number	PIMP Type	PIMP Name	PIMP (%)	Gross Area (ha)	Imp. Area (ha)	Pipe Total (ha)
1.000	User	-	100	0.006	0.006	0.006
1.001	-	-	100	0.000	0.000	0.000
1.002	-	-	100	0.000	0.000	0.000
2.000	User	-	100	0.006	0.006	0.006
2.001	-	-	100	0.000	0.000	0.000
2.002	-	-	100	0.000	0.000	0.000
				Total	Total	Total
				0.012	0.012	0.012

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
1.002		22.000	20.000	0.000	0	0

Free Flowing Outfall Details for Storm

Outfall Pipe Number	Outfall Name	C. Level (m)	I. Level (m)	Min I. Level (m)	D,L (mm)	W (mm)
2.002		22.000	20.000	0.000	0	0

Simulation Criteria for Storm

Volumetric Runoff Coeff	0.750	Additional Flow - % of Total Flow	0.000
Areal Reduction Factor	1.000	MADD Factor * 10m³/ha Storage	2.000
Hot Start (mins)	0	Inlet Coeffiecient	0.800
Hot Start Level (mm)	0	Flow per Person per Day (l/per/day)	0.000
Manhole Headloss Coeff (Global)	0.500	Run Time (mins)	60
Foul Sewage per hectare (l/s)	0.000	Output Interval (mins)	1

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Profile Type	Summer
Return Period (years)	100	Cv (Summer)	0.750
Region	England and Wales	Cv (Winter)	0.840
M5-60 (mm)	20.700	Storm Duration (mins)	30
Ratio R	0.441		

Online Controls for Storm

Orifice Manhole: 2, DS/PN: 1.001, Volume (m³): 0.0

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 49.690

Orifice Manhole: 5, DS/PN: 2.001, Volume (m³): 0.0

Diameter (m) 0.030 Discharge Coefficient 0.600 Invert Level (m) 49.690

Storage Structures for Storm

Cellular Storage Manhole: 1, DS/PN: 1.000

Invert Level (m) 49.700 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	32.0	0.0	0.109	0.0	0.0
0.108	32.0	0.0			

Cellular Storage Manhole: 4, DS/PN: 2.000

Invert Level (m) 49.700 Safety Factor 2.0
Infiltration Coefficient Base (m/hr) 0.00000 Porosity 0.95
Infiltration Coefficient Side (m/hr) 0.00000

Depth (m)	Area (m²)	Inf. Area (m²)	Depth (m)	Area (m²)	Inf. Area (m²)
0.000	32.0	0.0	0.109	0.0	0.0
0.108	32.0	0.0			

30 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.442
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.700	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	60 Winter	30	+0%					49.734
1.001	2	60 Winter	30	+0%					49.739
1.002	3	60 Winter	30	+0%					21.007
2.000	4	60 Winter	30	+0%					49.737
2.001	5	60 Winter	30	+0%					49.744
2.002	6	60 Winter	30	+0%					21.009

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.066	0.000	0.08		50	0.3	FLOOD RISK	
1.001	2	-0.051	0.000	0.08			0.3	FLOOD RISK	
1.002	3	-0.093	0.000	0.01			0.3	OK	
2.000	4	-0.063	0.000	0.09		50	0.4	FLOOD RISK	
2.001	5	-0.046	0.000	0.09			0.3	FLOOD RISK	
2.002	6	-0.091	0.000	0.02			0.3	OK	

100 year Return Period Summary of Critical Results by Maximum Level (Rank 1) for Storm

Simulation Criteria

Areal Reduction Factor	1.000	Additional Flow - % of Total Flow	0.000
Hot Start (mins)	0	MADD Factor * 10m³/ha Storage	2.000
Hot Start Level (mm)	0	Inlet Coeffiecient	0.800
Manhole Headloss Coeff (Global)	0.500	Flow per Person per Day (l/per/day)	0.000
Foul Sewage per hectare (l/s)	0.000		

Number of Input Hydrographs	0	Number of Storage Structures	2
Number of Online Controls	2	Number of Time/Area Diagrams	0
Number of Offline Controls	0	Number of Real Time Controls	0

Synthetic Rainfall Details

Rainfall Model	FSR	Ratio R	0.442
Region	England and Wales	Cv (Summer)	0.750
M5-60 (mm)	20.700	Cv (Winter)	0.840

Margin for Flood Risk Warning (mm)	300.0
Analysis Timestep	2.5 Second Increment (Extended)
DTS Status	OFF
DVD Status	ON
Inertia Status	ON

Profile(s)	Summer and Winter
Duration(s) (mins)	15, 30, 60, 120, 240, 360, 480, 960, 1440
Return Period(s) (years)	30, 100
Climate Change (%)	0, 40

PN	US/MH Name	Storm	Return Period	Climate Change	First (X) Surcharge	First (Y) Flood	First (Z) Overflow	Overflow Act.	Water Level (m)
1.000	1	60 Winter	100	+40%					49.764
1.001	2	60 Winter	100	+40%					49.781
1.002	3	60 Winter	100	+40%					21.010
2.000	4	60 Winter	100	+40%					49.772
2.001	5	60 Winter	100	+40%					49.787
2.002	6	60 Winter	100	+40%					21.011

PN	US/MH Name	Surcharged Depth (m)	Flooded Volume (m³)	Flow / Cap.	Overflow (l/s)	Half Drain Time (mins)	Pipe Flow (l/s)	Status	Level Exceeded
1.000	1	-0.036	0.000	0.13		54	0.5	FLOOD RISK	
1.001	2	-0.009	0.000	0.12			0.5	FLOOD RISK	
1.002	3	-0.090	0.000	0.02			0.5	OK	
2.000	4	-0.028	0.000	0.13		57	0.5	FLOOD RISK	
2.001	5	-0.003	0.000	0.12			0.5	FLOOD RISK	
2.002	6	-0.089	0.000	0.03			0.5	OK	

Appendix B – Exceedance Plan

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS, ENGINEERS AND SPECIALISTS DRAWINGS AND SPECIFICATIONS.

DO NOT SCALE FROM THIS DRAWING.

ALL DRAWINGS TO BE PRINTED IN COLOUR

LEGEND

- EXCEEDANCE FLOW
- EXISTING BUILDINGS
- PROPOSED BUILDING
- EXISTING ROAD GULLY

NOT FOR CONSTRUCTION

Rev	Date	By	Chk	Description
P01	20.09.24	JDi	TKe	Issued for Information

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Project

Kingsway House
London

Drawing Title

Proposed Exceedance Flow Path Plan

Scale	EWP Project	Date	Drawn
1:100 @ A1	2230217	September 2024	JDi

Design Phase	Status	Revision
For Information	S2	P01

[Project]-[Origin]-[Function]-[Spatial]-[Form]-[Discipline]-[No.]

2230217-EWP-ZZ-00-DR-C-12001